



# MONTANA DNRC Conversation

A Newsletter of the Department of Natural Resources and Conservation • Director Bud Clinch  
Winter 2003

## —TRASH RAKE AT BROADWATER POWER PROJECT—

*This article is adapted from "Trash Rake Replaced at the Broadwater Power Project," by Walt Anderson, which appeared in the Winter 2003 issue of Water Lines, a newsletter of DNRC's Water Resources Division.*

A new trash rake machine has been installed at the Broadwater Power Project, which is situated on the Missouri River near Toston.



Photo by Walter Leiler, Kuens America Inc

New trash rake machine at the Broadwater Power Project

Of the more than 20 dams and 250 miles of irrigation canals managed by DNRC's Water Resources Division (WRD), the Broadwater-Missouri is the only hydropower facility. With a maximum rated capacity of 10 megawatts, the project began generating power in June 1989. DNRC contracted with Montana Power Company (now NorthWestern Energy) to distribute and sell the electricity. Project revenues are first used to repay bonds and cover operating expenses. Any additional revenues, above the amounts needed for those two purposes, are used to rehabilitate other state-owned water projects; in an average year, before installation of the new trash rake, approximately \$900,000 was available for this purpose.

The trash rake's function is to clean the intake racks of river debris too large to pass through the turbine.

For Broadwater, this means that all debris larger than 3 inches in diameter is strained from the river before it enters the turbine by passing the flow through a set of trash racks with 3-inch bar openings.

The original trash rake was designed to reach to the bottom of the racks, through water about 55 feet deep, and drag the racks in an upward direction, thereby scraping debris to the surface. From there, the debris was dumped onto a conveyor that transferred it to a point near the first spillway bay. The operation required constant surveillance and manual labor with chain saws and hand rakes, and the operators were sometimes exposed to severe weather and water conditions. Plant Operator Brian Carroll and Plant Superintendent Mike Sims work fulltime at the Broadwater Power Project; Walt Anderson is supervisor of WRD's Hydropower Section.

The original system was purchased under a low-bid contract in 1989. By the year 2000, the machine had been severely weakened structurally. Although the machine was still operating, it was clearly at the end of its useful life. The machine's true usefulness, safety, and the impacts to power generation as a result of its inadequacies were evaluated, and a strong case was made for its replacement.

In the fall of 2000, the Broadwater operation and maintenance crew began the process of replacing the existing trash rake. Rather than procuring a replacement under a low-bid approach, staff argued successfully that the project qualified for a Request for Proposal (RFP) approach under the Montana Procurement Act. The reasons for this approach are many, but the primary justification was that the complexity of the project required a custom-designed solution. Turbine intake configurations are many, and the type and size of river debris are also quite variable from site to site. In addition, the Broadwater intake was experiencing serious sediment accumulation each year. Trash rake manufacturers approach the problem

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with about five or six basic designs, varying in quality of manufacture. The Broadwater staff believed it imperative (1) that the decision be performance-based rather than cost-based, and (2) that the staff's 12 years of experience working on the river should be relied on heavily in order to make the correct decision.

A purchase budget was established by analyzing past operating data and estimating losses due to trash obstructing the delivery of water to the turbine. Funding authorization was acquired, and the RFP documents were issued in March 2001. The three proposals received were evaluated and scored according to established criteria that had been published in the RFP documents. Kuenz America Inc., whose base of operations is in Austria, was selected and awarded a contract for \$434,000.

It was hoped that the new machine would be manufactured in time for installation in the fall of 2001. Although problems with insurance requirements postponed the installation until May 2002, the trash rake was in place in time for spring runoff.

The new machine is a prototype design, but relies on proven technology. Essentially, it's a robotic excavator arm and gripper rakehead mounted on a rail-supported trolley, with manual or fully automatic operating modes. The machine is capable of lifting 9,000 lbs. at the intake racks, has a horizontal reach of 74 feet, and has 270 degrees of rotation. It is easily capable of reaching the required 55 feet of water depth and dragging the intake bottom for some distance upstream of the trash racks. These mechanical features enable the machine to handle all debris, from full-sized cottonwood trees to the finest sediment, and move it from the intake to downstream of the dam (see photo on page 6).

As a result, the plant has been operating at optimum power-generating levels since the trash rake's installation, and, for the first time in 13 years, it was unnecessary to dredge the turbine intake after spring runoff. Improvements in plant efficiency directly attributable to the new machine will allow payoff of its purchase price in roughly five to six years, depending on streamflow conditions. Most importantly, plant operators are much safer performing the work, and those long hours during spring runoff aren't so long anymore.

## —NEW DIVISION ADMINISTRATOR—

Bob Harrington became Montana's newest "State Forester" in October, when he was named administrator of DNRC's Forestry Division. Bob succeeds Don Artley, who retired in May 2002 after 27 years with the department.

Harrington is responsible for managing the Forestry Division, which provides fire and aviation management and service forestry functions through its Missoula headquarters and a network of field offices located across the state. During his tenure with DNRC and the former Department of State Lands, Bob gained valuable experience in numerous DNRC programs, including forest management, service forestry, special use management, and fire management.

Harrington will be active with forestry issues within Montana, and will serve as liaison to the National Association of State Foresters, the Western Forestry Leadership Council, and the National Wildland Fire Coordination Group.

Bob graduated from the University of Montana in 1983 with a degree in forest resources management. He started working for DNRC in 1983 as a hydrology technician in the Forest Management Bureau. Since then, he has worked at the Stillwater State Forest, the U.S. Peace Corps in Tanzania, and DNRC's Central Land Office in Helena in various positions in forest management and special use management. At the time of his appointment, Bob was the area manager of DNRC's Southern Land Office in Billings.



Bob Harrington



## —DNRC SERVICE FORESTER HONORED—

For the second consecutive year, Service Forester Michael Justus has been named "Inspector of the Year" by the Montana Tree Farm System (MTFS). Justus, who works out of DNRC's Libby Unit Office, received the award in September at the annual MTFS convention.

The Montana Tree Farm System is a nonprofit organization affiliated with the National Tree Farm System and American Forest Foundation. Its purpose is to help private forest landowners manage their lands with the goals of conserving forests, water, and wildlife while promoting natural-resource-based recreational opportunities. MTFS supports the responsible harvesting of renewable natural resources and the Montana wood products industry.

Nearly 400 tree-farming parties are enrolled in the system. The farms must be inspected initially to receive certification and then every five years as a follow-up, must be at least 10 acres in size, and must produce commercial forest products.

Tree farm inspectors, who now number 70, must hold a bachelor's degree in forestry, be certified by MTFS, and have participated in a mentoring program. The inspections ensure that the farmers are using good tree farm ethics and practices consistent with sustainable forestry. The Inspector of the Year Award is based on the number of people the inspectors enroll in the system and the number of reinspections. The number has increased over the last few years, according to Justus, because 40 new tree farms have been enrolled in the program.

Justus's work with the MTFS is only a portion of his workload. And, in conjunction with his work with DNRC, Michael has become very involved in several civic and community organizations and their projects, primarily in Lincoln County, but also in Sanders, Flathead, and Lake Counties.

He has been a member of the Tobacco Valley Economic Development Council, for instance, helping it



Michael Justus

Photo by Bill Caldwell

develop natural resources to the greatest benefit, and he received the Community Service Award for community improvement projects in Eureka. He has chaired both the Northwest RC&D committee and Lincoln Conservation District, and he has been a member of the Lincoln County Fair Board, Eureka River Walk Committee, and the Montana Tree Farm Association Steering Committee. Other organizations that Michael has worked with include the Cub Scouts; 4-H; Montana Department of Fish, Wildlife and Parks; Eureka Chamber of Commerce; Stimpson Lumber Company; U.S. Forest Service; and Society of American Foresters.

His numerous grant proposals have resulted in many projects, including National Fire Planning assistance, community park development, and acquisition of low impact, small-timber-harvesting equipment that is available to the public. Accomplishments in Lincoln County over the last five years, which equate to well over \$1 million dollars in grants and in-kind services for natural resource improvements, include several tree plantings, assisting a local mill in retooling to handle small diameter trees, helping Eureka become a Tree City USA, and developing a new fishing pond and outdoor pavilion with an environmental education center.

Obviously, Michael does much of this work as a volunteer, devoting over 360 hours of his own time each year to assisting groups and organizations for the betterment of northwestern Montana. He is, however, quick to note that his volunteer work has made a difference in the amount of work he has been able to accomplish as a service forester. Michael said, "Building partnerships and pooling resources is a great way to deliver state programs and provide assistance to our communities."

"While some of these roles may not be traditional for our service foresters, they exemplify Michael's commitment to wise resource management and its role in community betterment," said Libby Unit Manager Bill Caldwell, who is Michael's supervisor. "His many accomplishments and activities are not only a credit to him personally, but also a very positive reflection on DNRC."

## —DNRC RETIREMENTS: ONWARD & UPWARD—

### Northwestern Land Office

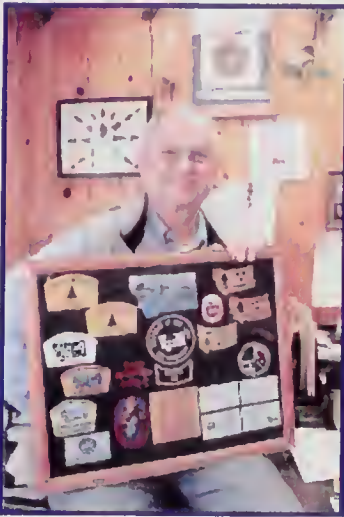
Jack Isaacs worked for the Forestry Division for 30 years, starting in June 1972. He began his career with DNRC in Missoula, working in fire and timber, and he later settled into timber sale administration in Plains. Since retiring, Jack has relocated to Polson. He plans to relax and think about building a shed in the spring.



Jack Isaacs

Photo by Linda Isaacs

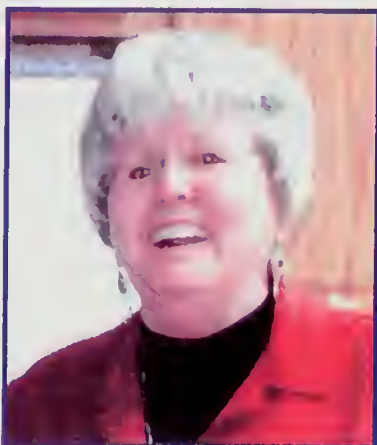
Bill Wright worked for the Forestry Division for 39 years, most recently as a resource program (unit) manager serving the areas of Kalispell and Plains. He started his career with DNRC in October 1963. Bill's retirement plans are to spend time with his family and to sit back and see what the future holds.



Bill Wright

Photo courtesy of Daily Inter Lake, Kalispell

### Water Resources Division



Patricia Boggess

Photo by Gloria Goble

Patricia Boggess retired on December 27, 2002, with 11 years of experience with DNRC. She began with the Energy Division, which was part of DNRC before the most recent reorganization. At the time of her retirement, she was providing administrative support services to WRD's Water Operations Bureau and the Board of Water Well Contractors. Pat plans on traveling, relaxing, and just possibly—starting a home-based business.

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Retirements *continued from page 4*

Bob Clark began working for DNRC in 1970, but was soon drafted and served two years in Berlin, Germany. Upon his return in 1972, he continued working for DNRC's Water Resources Division, as a civil engineer specialist, until December 31, 2002.

*Bob Clark**Photo by Art Taylor**Robin Harper**Photo by Nancy Hughes*

Robin Harper came to DNRC from the Department of Revenue in October 1974. He has been the Water Resources Division's fiscal and personnel manager. His immediate plans are to take a month-long trip to Portugal and to build a new house.

Glen McDonald transferred to DNRC from the Department of Highways in 1978 as a dam safety engineer. He worked as a dam safety program manager under the U. S. Corps of Engineers' Dam Safety Inspection Program until 1981, when he became supervisor of WRD's Project Rehabilitation Section. Glen became bureau chief of the State Water Projects Bureau in 1992. At his retirement, Glen had worked for DNRC and the citizens of Montana for 28 years.

*Glen McDonald**Photo by Art Taylor*

## —SAFETY TIP: ADJUST HEADRESTS—

The following article is by Tony Nelson.

In light of my recent involvement in an automobile accident, I would like to take the opportunity to re-enforce and encourage the use of a safety feature included in most vehicles. At a defensive driving course I once attended, we were told that the primary purpose of a headrest on a car seat is to support the head and lessen the severity of a "whiplash" effect. If the headrest is adjusted to the proper height, approximately even with the back of the head, it can substantially reduce neck damage during a vehicle collision.



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On Tuesday, December 11, 2002, Norm Merz, Gary Hadlock, and I<sup>1</sup> were in a sedan and stopped for a red light. Approximately 2 seconds after we stopped, our car was struck by the car behind us. The driver of this car intended to "make the light" and assumed I would do the same. She never locked up her brakes and hit us quite hard, sending our car forward about 20 feet from a dead stop with the brakes on. By pure luck, the headrest on the driver's seat was at the right height for my head (I had not remembered to adjust it when I got in), and, as a result, my head snapped only about 2 inches before it hit the headrest, keeping my head relatively in line with my body. Norm's headrest was not adjusted up at all, so his head snapped a fair bit more, giving him some muscle soreness. Gary was in the back seat and had no headrest. He is doing pretty well in spite of this.

The moral of the whole story is to try to make it a habit to check and adjust the headrest in a vehicle before driving. You never know what the other drivers on the road are going to do, and this simple step could potentially save you a lot of pain and/or injury.

1. Hydrologist Tony Nelson, Wildlife Biologist Norm Merz, and Forest Engineering Specialist Gary Hadlock all work out of DNRC's Northwestern Land Office in Kalispell.

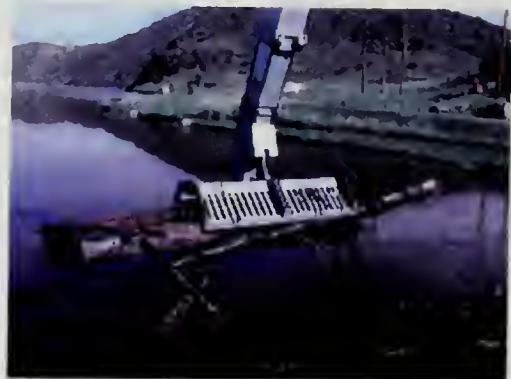
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Trash rake lifting debris at DNRC's Broadwater Power Project

Photo by Walter Leber, Kuentz America Inc



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